

April 1, 2017

Lit. No. 80360, Rev. 03



# Regular and High Capacity Hopper Spreaders Installation Instructions



**Read the Installation Instructions before installing this unit.**

**This manual is for Western Regular and High Capacity Hopper Spreaders with serial numbers (3850 - ).**



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## SAFETY

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### Safety Definitions



**WARNING:** The symbol at left identifies a **SAFETY WARNING** that indicates a potentially hazardous situation that, if not avoided, could result in death or serious personal injury.

**CAUTION:** Indicates a situation that, if not avoided, could result in damage to product or property.

**NOTE:** Identifies tips, helpful hints, and maintenance information the reader should know.

### Safety Precautions

Observe the following safety procedures before and during the use of the spreader. By following these rules and applying common sense, possible personal injury and potential damage to the machine may be avoided.



#### WARNING:

- Before working with the spreader, secure all loose fitting clothing and unrestrained hair.
- Before starting the spreader, check that all personnel and equipment are clear of the spreader and the spray area.
- Before operating the spreader, check that all safety guards are in place.
- Keep hands, feet, and clothing away from power-driven parts and the conveyor chain.
- Do not climb on or allow others to climb on the spreader at any time while operating.

#### CAUTION:

- Before operating the spreader, reassemble any parts or hardware that were removed.
- Before operating the spreader, remove materials such as cleaning rags, brushes, and hand tools from the spreader.

## GENERAL

### Torque Chart

When tightening fasteners, refer to Table 1, Torque Chart, for the recommended fastener torque values.

**Table 1: Torque Chart**

Recommended Fastener Torque Chart (Ft.-Lb.)			
Size	SAE Grade 2	SAE Grade 5	SAE Grade 8
1/4-20	6	9	13
5/16-18	11	18	28
3/8-16	19	31	46
3/8-24	24	46	68
7/16-14	30	50	75
1/2-13	45	75	115
9/16-12	66	110	165
5/8-11	93	150	225
3/4-10	150	250	370
7/8-9	202	378	591
1-8	300	583	893
Metric Grade 8.8 (Ft.-Lb.)			
Size	Torque	Size	Torque
M 6	7	M 12	60
M 8	17	M 14	95
M 10	35	M 16	155
These torque values apply to mount assembly fasteners except those noted in the instruction.			

### Material Weights

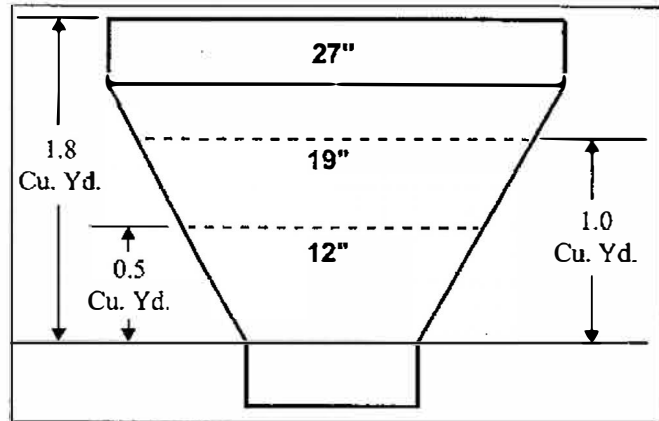
Refer to Table , Material Weights, for the weight per cubic yard of common spreading materials.

**Table 2: Material Weights**

MATERIAL	WEIGHT (lb. per cubic yd.)
Fine Salt - Dry	2,025
Coarse Salt - Dry	1,431
Coarse Sand - Dry	2,700
Coarse Sand - Wet	3,240
Cinders	1,080

### Regular Capacity

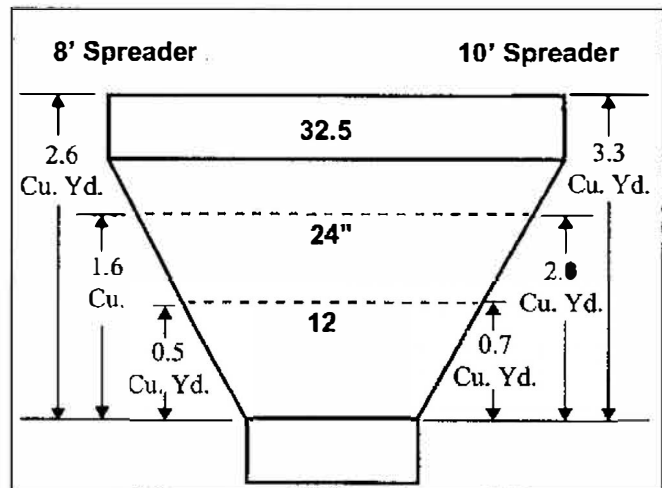
See Figure to determine the correct amount of spreading material for the regular capacity hopper spreader.



*Figure 1*

### High Capacity

See Figure to determine the correct amount of spreading material for the high capacity hopper spreader.



*Figure 2*

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## INSTALLATION INSTRUCTIONS

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### Mounting the Spreader onto the Vehicle

**NOTE:** Periodically through the snow season, verify the mounting devices are secure.

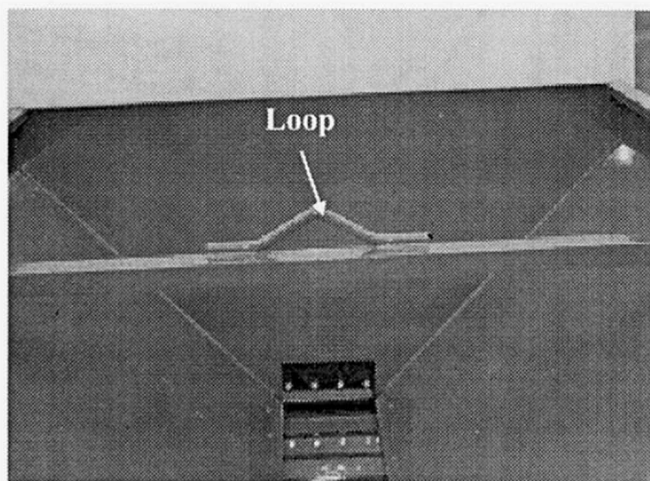
1. Remove the tailgate from the truck.
2. Lift the spreader. See appropriate instructions below.



**WARNING:** Before lifting, verify hopper is empty of material. The lifting device must be able to support the spreader's weight.

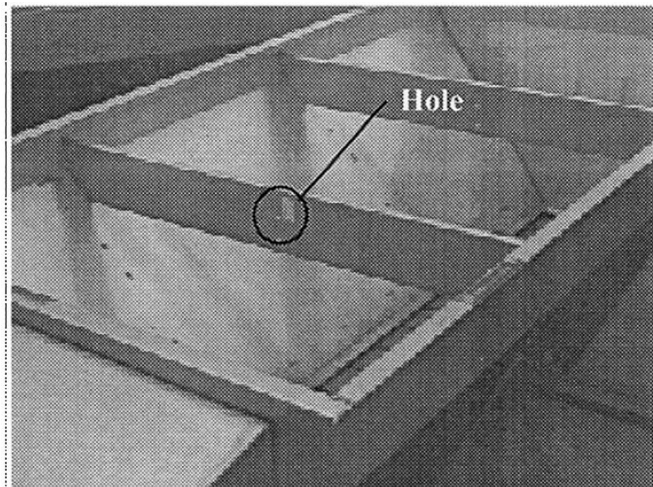
**Regular Capacity:** Lift spreader by hooking the loop (Mild Steel) or hole (16-Gauge Stainless Steel) located on rear cross channel inside hopper.

**NOTE:** The loop or hole is located at the approximate balance point of the spreader. The balance point may vary with engine fluid levels, battery, top screen, or residual material in hopper. See Figures 3 and 4.



Mild Steel Spreader

Figure 3



Stainless Steel Spreader

Figure 4

**High Capacity:** Lift spreader by hooking all four loops located at the corners of the hopper. See Figure 5.

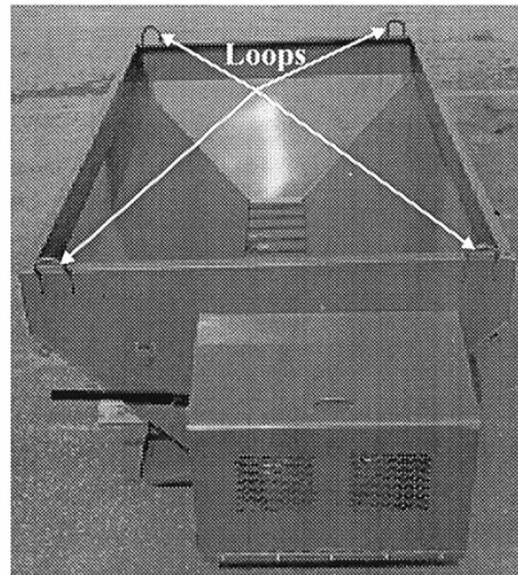


Figure 5

## INSTALLATION INSTRUCTIONS

- Before lowering the spreader, place lengths of lumber (2"x4"x48" minimum) under the side ribs. By elevating the spreader off of the vehicle, it is easier to remove excess material that accumulates under the spreader. See Figure 6.

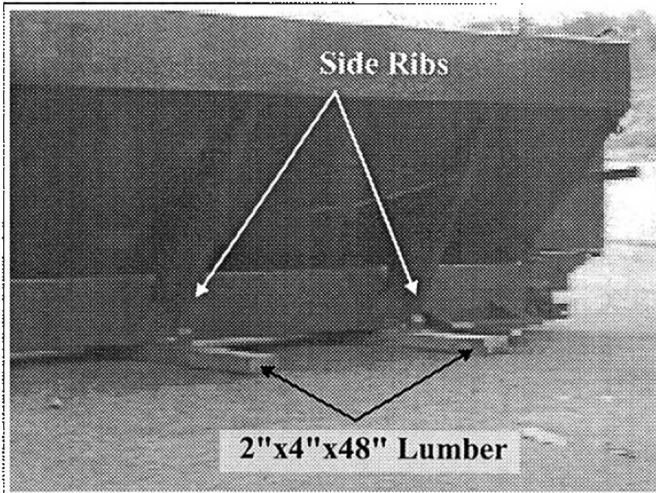
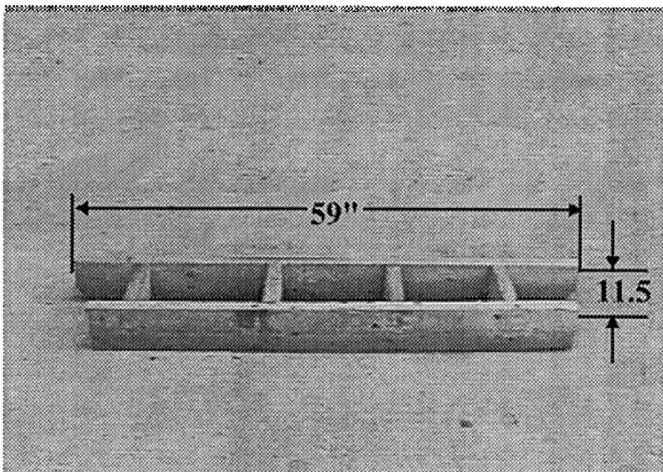


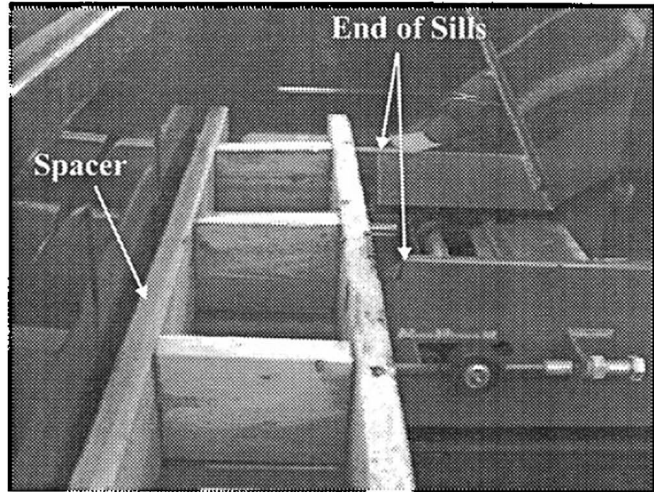
Figure 6

- Center the spreader on the vehicle with the end of the spreader sills 11" to the rear of the nearest vertical obstruction (bumper, trailer hitch, etc.).
- Measure the distance from the front of the truckbed to the sills and make a spacer to place between the bed and the rails. See Figures 7 and 8 for approximate size, shape, and location of spacer.



Example of a Spacer

Figure 7



Placement of the Spacer

Figure 8

- Bolt the spreader to the vehicle frame through the lengths of lumber (step 3, page 3) using the holes located at each lower support leg. Use 1/2" hardware as required by vehicle application.

**NOTE:** Pay special attention when drilling or clamping dissimilar metals to aluminum bodies. Galvanic corrosion can occur if not handled properly. Contact vehicle manufacturer for recommended attachment practices.



**WARNING:** Spreader must be bolted to vehicle frame. Do not rely on tie-down chains alone to hold spreader in vehicle.



## INSTALLATION INSTRUCTIONS

### Chute Assembly

1. Loosely attach the chute assembly using four 3/8" x 3/4" bolts, flat washers, lock washers, and nuts with the heads of the bolts on the inside of the chute. See Figure 9.

**NOTE: High Capacity 31" Chute Assembly -**  
Remove access panel on back of chute housing to aid installation.

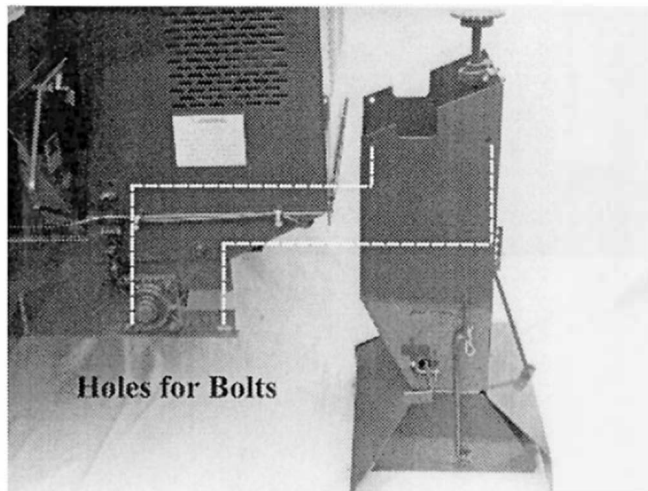


Figure 9

2. Push the chute assembly toward the front of the vehicle. DO NOT tighten the bolts at this time.
3. Install the roller chain between the spinner shaft sprocket and the gear case sprocket with the master link. See Figure 10.

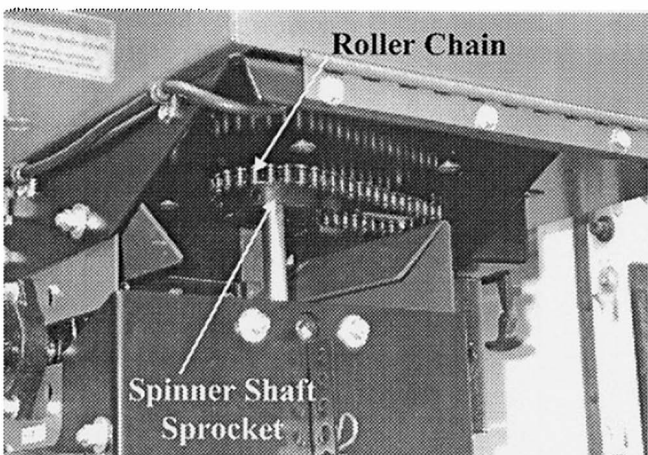


Figure 10

4. Verify the sprockets are in line and the set screws are tight.
5. To adjust roller chain tension, loosen the spinner shaft bearing bolts and move the spinner shaft away from the gear case. Correct chain tension allows a 5/16" deflection midway between the sprockets. See Figure 11.

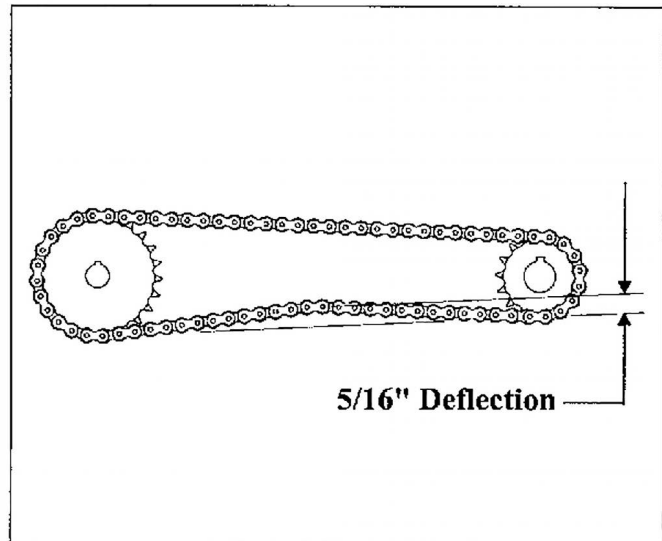


Figure 11

Make sure the spinner shaft is vertical and the sprockets are lined up before re-tightening the fasteners.

6. Additional chain tension may be applied by pulling the chute assembly toward the rear.

**CAUTION: Overtightening the roller chains may damage the bearings on the gear case, the engine, and/or the spinner shaft. Overtightening will also shorten the life of the roller chain and of the sprockets.**

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## INSTALLATION INSTRUCTIONS

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7. Tighten all fasteners according to the Torque Chart on page 2.
8. Install the chain guards using 1/4" x 3/4" long hex cap screws, lock washers, and nuts. See Figure 12.
9. Install the sprocket guard using 3/8" carriage bolts, lock washers and nuts. See Figure 12.

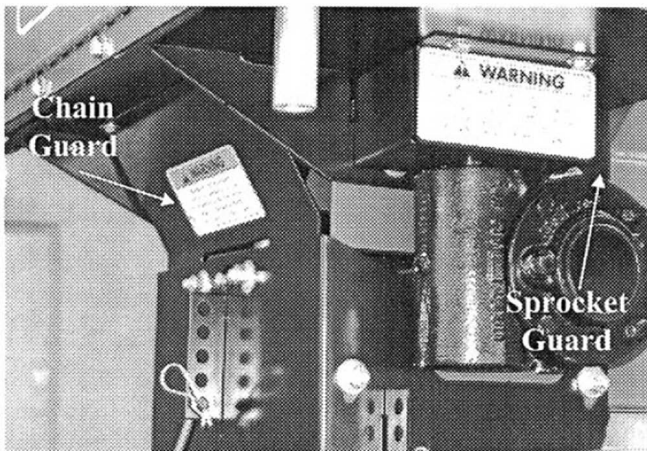


Figure 12

10. **High Capacity Hopper Spreader 31" Chute Only:** Secure the access panel onto the chute housing.

### Cab Control and Wire Harness Installation

**NOTE:** Use dielectric grease (provided) on all electrical connections.

1. All spreaders are shipped from the factory with the spreader harness wired to the engine, clutch, and electric throttle.  
*All Spreaders:* Attach the spreader harness to the side of the spreader using pre-drilled holes, #6 clamp loops, and tap screws.
2. Plug the vehicle harness into the spreader harness.
3. Lay out a path for routing the vehicle harness into the cab through the floor of the truck checking that the vehicle harness avoids any hot or moving parts of the truck. The routing will vary from truck to truck.
4. Identify a convenient location for the cab control that can be reached by harnesses and wiring.

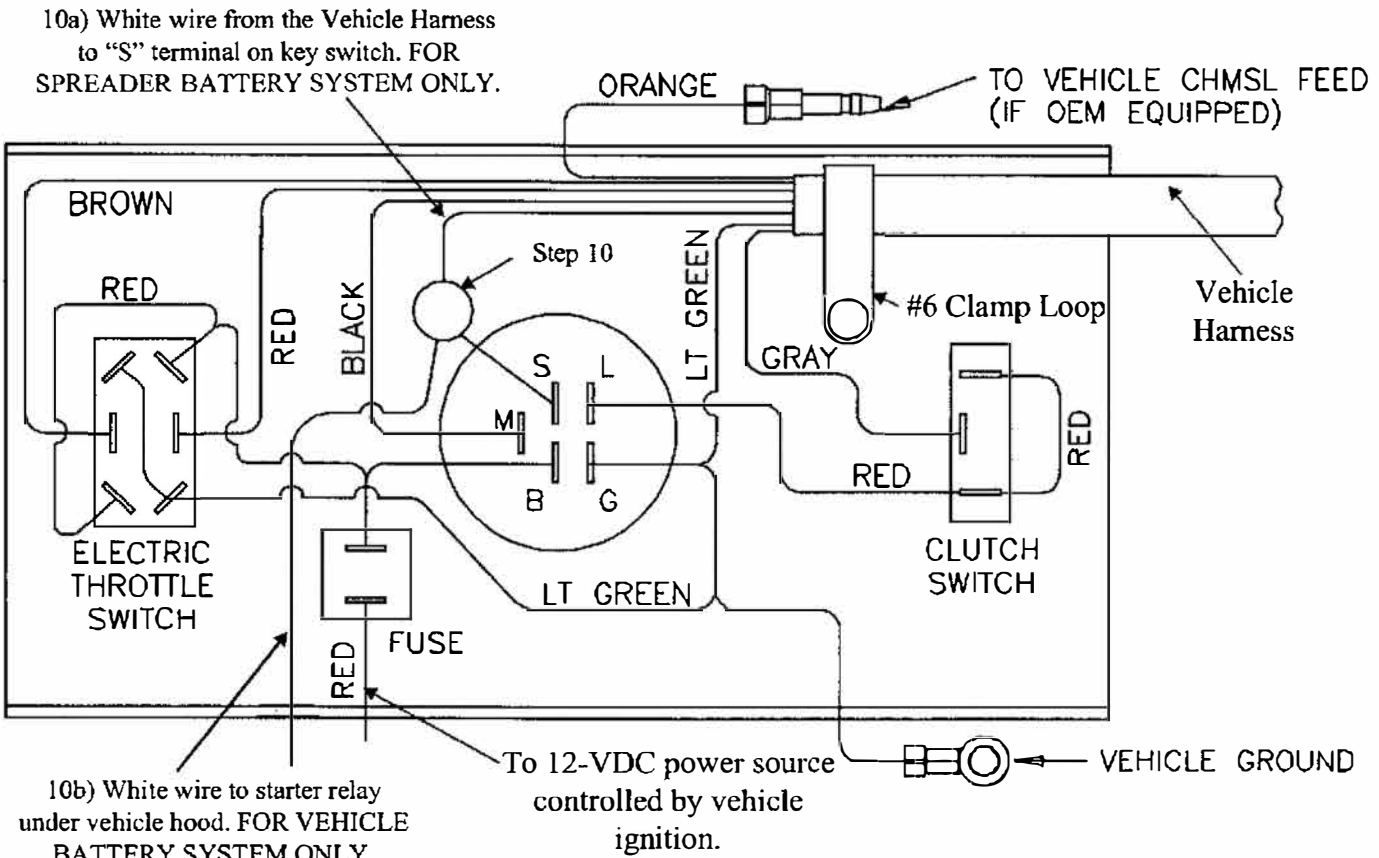
**NOTE:** Due to the variety of possible in-cab locations, a mounting bracket is not provided.

5. Drill a 5/8" hole in the floor so that the vehicle harness can reach the desired cab control location.

**CAUTION:** Before drilling any holes, check both sides of the material for any wires, fuel lines, fuel tanks, etc. that may be damaged by drilling.

6. Insert the grommet into the hole.
7. Route the harness to the desired location.
8. Secure the harness to the truck. Verify the harness cannot drop onto the road when it is disconnected from the spreader.

## INSTALLATION INSTRUCTIONS



*Figure 13*

Refer to Figure 13 for steps 9-12.

9. Use a #6 clamp loop to secure the vehicle harness to the cab control bracket.
10. Connect the vehicle harness wires to the spreader cab control electrical terminals.
  - a) **For Spreader Battery System ONLY**  
Connect the white wire from the vehicle harness to the "S" terminal on the key switch.
  - b) **For Vehicle Battery System ONLY**  
The white wire from the vehicle harness will not be used. Connect the relay wire – white (supplied with the vehicle battery kit) from the starter relay to the "S" terminal on the key switch. Also refer to the Vehicle Battery Kit Installation Instructions in this manual.

**CAUTION:** Protect the wire harnesses from abrasion and cutting caused by sharp edges during installation and operation. Use tape, grommets, etc.

11. Connect the light green wire from the vehicle harness to a known ground on the vehicle.
12. Connect the power wire—red to an accessory wire/terminal that is controlled by the vehicle's ignition switch.
13. Fabricate any needed brackets and fasten cab control bracket in the cab of the truck.
14. Install the plug cover and hook onto the harnesses.

## INSTALLATION INSTRUCTIONS

### Plug Cover Installation

Figure 14 shows how to install the plug cover.

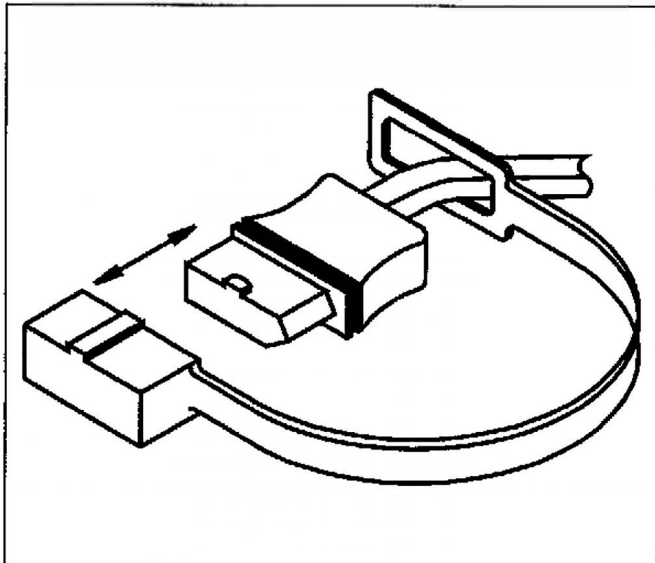


Figure 14

### Hook Installation

Refer to Figure 15 for the following steps.

1. Position the legs of the hook over the spreader harness.
2. Twist the hook to spread the wire.
3. Rotate the hook and push over the spreader harness.
4. Squeeze the legs of the hook together and slide the hook over the spreader harness plug.

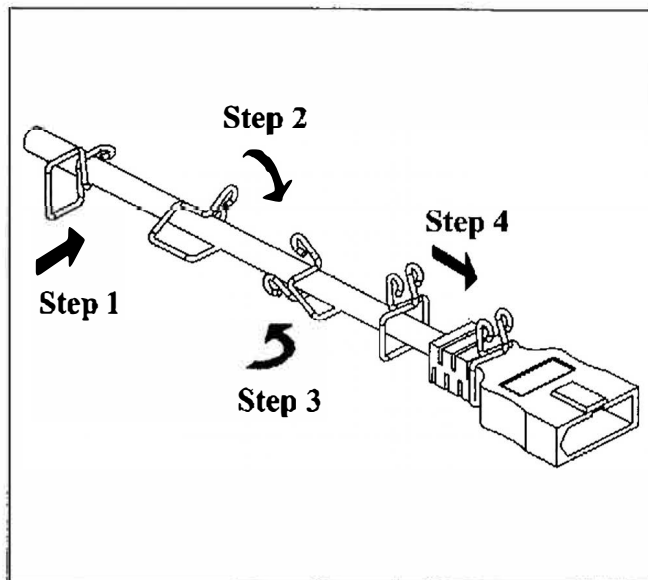


Figure 15

### Using the Hook

After connecting the spreader harness plug with the vehicle harness plug, secure the plug cover into the legs of the hook as shown in Figure 16.

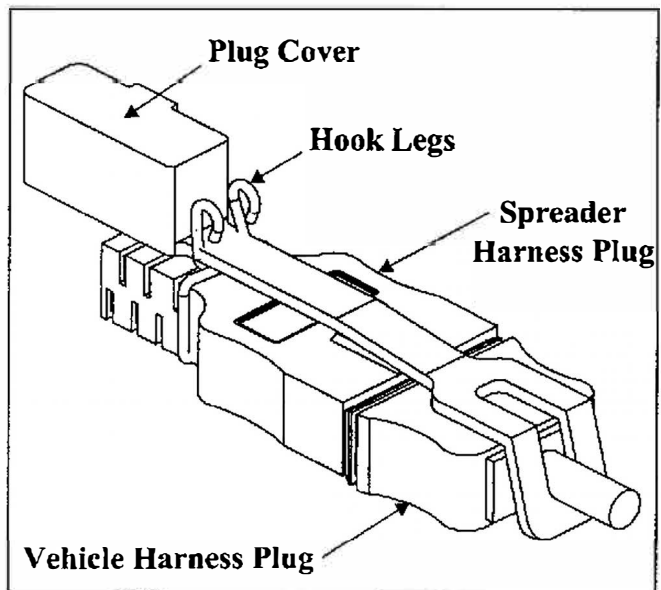


Figure 16

## INSTALLATION INSTRUCTIONS

**NOTE:** Install either the Spreader Battery Kit or the Vehicle Battery Kit (see page 11).

### Spreader Battery Kit Installation

**NOTE:** Apply dielectric grease to all electrical terminals before assembly.

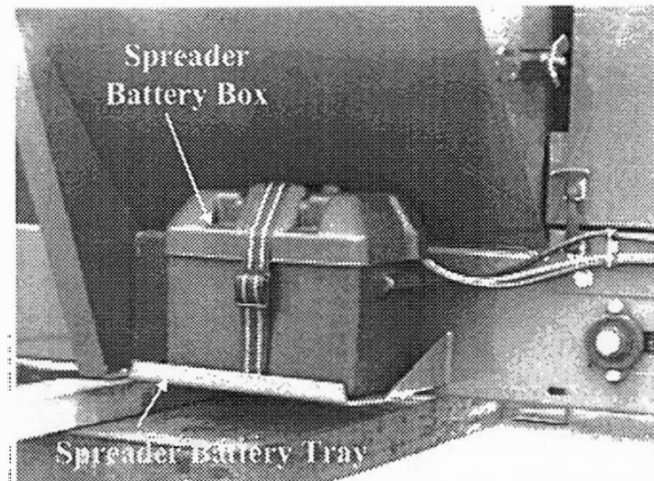
#### Battery Safety



**WARNING:** Follow these warnings to avoid personal injury and damage to the equipment.

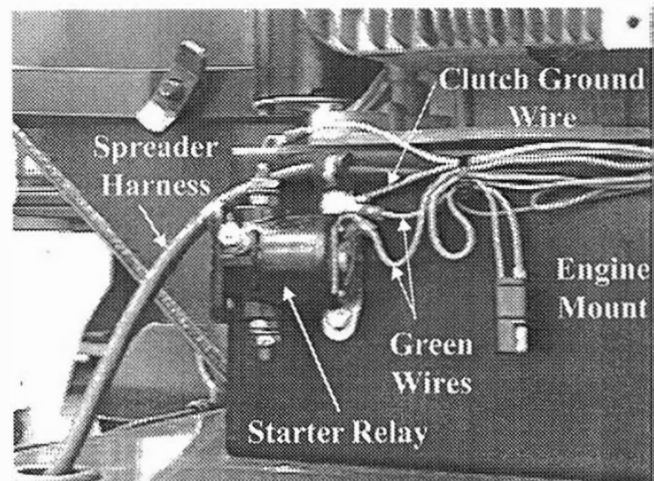
- Avoid exposing battery to a spark or flame.
- Always charge battery in a well ventilated area.
- Avoid contact with battery acid. It can cause serious personal injury and damage to the equipment.
- Always disconnect battery before removing or replacing any electrical components.
- Never lay anything on a battery. This could result in electrical shock or burns, or damage to the vehicle or equipment.

1. Install a 12-volt battery with a minimum of 400 cold cranking amps rating. The battery box will accept any Group 65, 64, 27, 24, or 22 series Top Terminal battery. See Figure 17.



*Figure 17*

2. Mount the starter relay to the engine mount using two 1/4-20 cap screws, external tooth lock washers, and nuts. Connect the two green wires, the spreader harness, #6 clamp loop, and the clutch ground wire to the upper starter relay mounting bolt. See Figure 18.

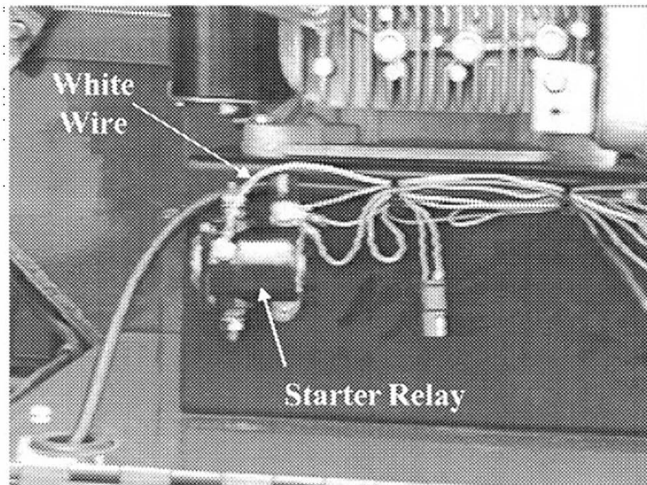


*Figure 18*

Continued on next page.

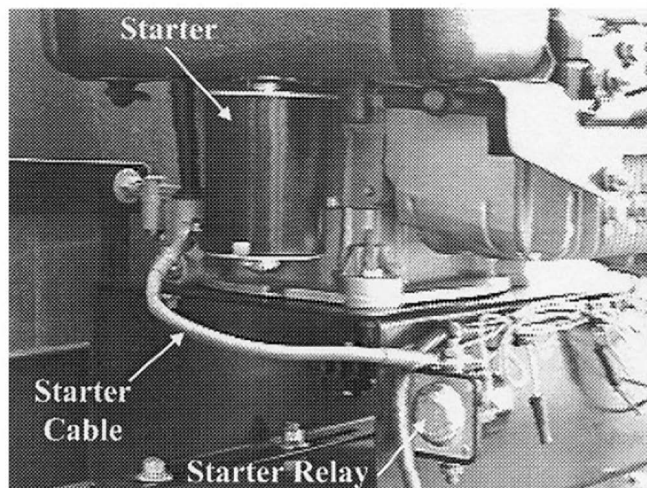
## INSTALLATION INSTRUCTIONS

3. Connect the white wire from the spreader harness to the primary terminal of the starter relay. See Figure 19.



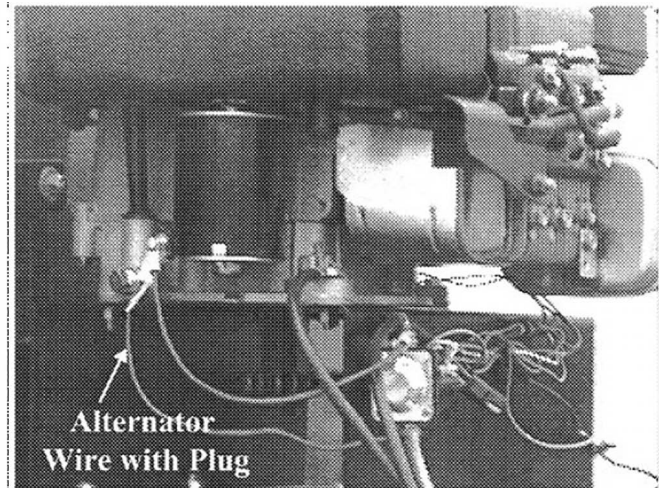
*Figure 19*

4. Connect the starter cable from the starter to one of the large secondary terminals of the starter relay. See Figure 20.



*Figure 20*

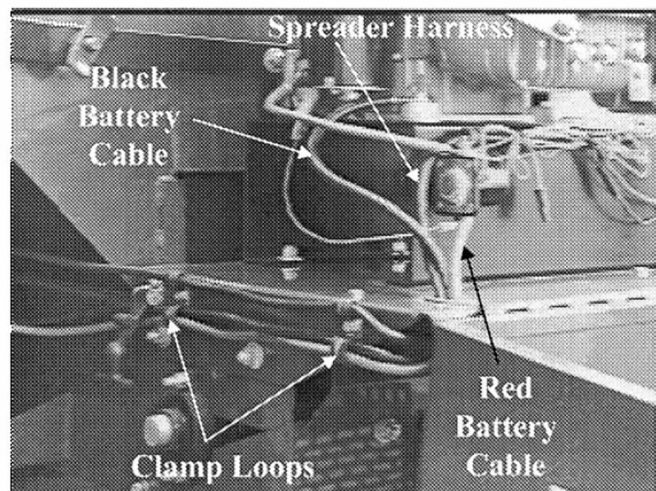
5. Connect the alternator wire with plug to the alternator lead of the engine. See Figure 21.



*Figure 21*

6. Route the battery cables as shown in Figure 22. Secure with #10 clamp loops.

**NOTE: Use the fasteners that secure the spreader harness for securing the spreader cable.**



*Figure 22*



## INSTALLATION INSTRUCTIONS

7. Connect the alternator wire with plug and the red battery cable to the unused secondary terminal of the starter relay. See Figure 23.

**NOTE: The white alternator wire is not used.**

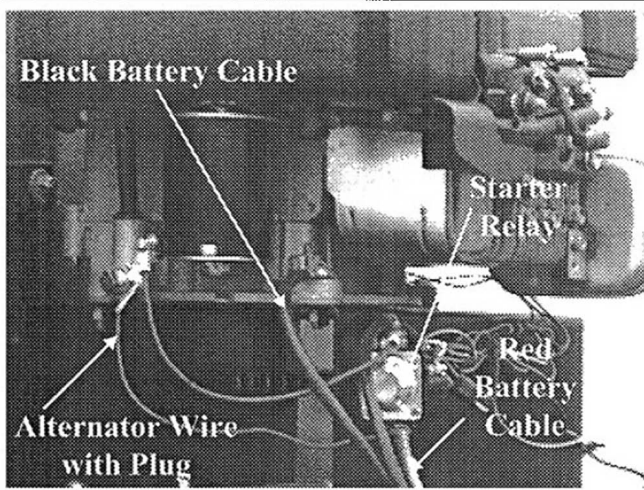


Figure 23

8. Connect the red battery cable to the POSITIVE (+) terminal of the battery.
9. Attach one end of the black battery cable to the spreader engine mounting flange using the existing 5/16" bolt, nut, lock washer, and supplied flat washer. See Figure 23.
10. Connect the unused end of the black battery cable to the NEGATIVE (-) terminal of the battery.

### Vehicle Battery Kit Installation

#### Battery Safety



**WARNING: Follow these warnings to avoid personal injury and damage to the equipment.**

- Avoid exposing battery to a spark or flame.
- Always charge battery in a well ventilated area.
- Avoid contact with battery acid. It can cause serious personal injury and damage to the equipment.

- Always disconnect battery before removing or replacing any electrical components.
- Never lay anything on a battery. This could result in electrical shock or burns, or damage to the vehicle or equipment.

**NOTE: Apply dielectric grease to all electrical terminals before assembly.**

#### Battery

1. Verify vehicle battery is in good condition.
2. Disconnect the ground cable from the battery.

#### Starter Relay

Refer to Figure 24 below for Starter Relay, Battery Cable, and Relay Wire Installation.

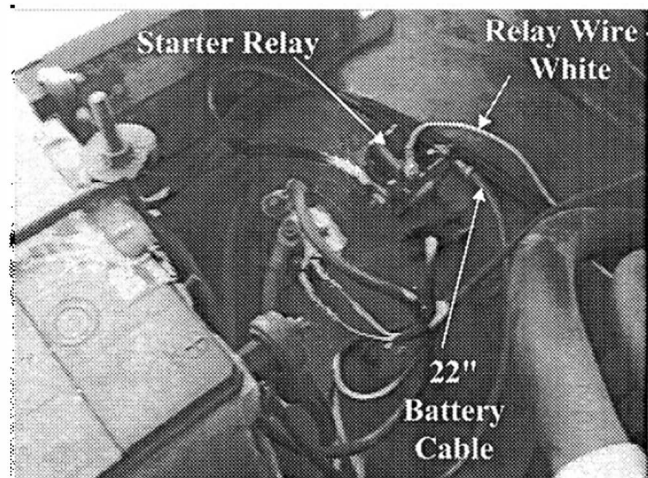


Figure 24

1. Locate an area protected from road splash for the starter relay within 18" of the vehicle's primary battery. The mounting surface needs to be grounded.

**NOTE: If a grounded surface is not available, install a 16-gauge wire (not supplied) between a known ground and the starter relay mounting flange after starter relay installation.**

2. Using the starter relay mounting flange as a template, drill two 9/32" holes and fasten with two 1/4" x 3/4" bolts, flat washers, and locknuts.

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## INSTALLATION INSTRUCTIONS

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### Battery Cable

1. Install the 22" battery cable between the POSITIVE (+) battery terminal and to one of the large secondary terminals of the starter relay.

**NOTE: A Battery Cable Adapter Kit is provided for side terminal batteries.**

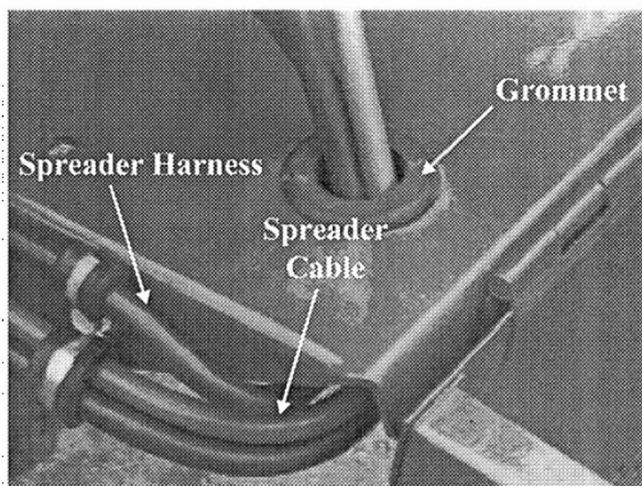
2. Verify the cable is protected or secured away from all sharp edges, and hot or moving parts.

### Relay Wire

1. Install and secure the relay wire—white between the cab control and the primary terminal of the starter relay. See Figure 13 on page 7 to connect the relay wire—white to the keyed ignition switch.
2. Verify the wire is protected or secured away from all sharp edges, and hot or moving parts.

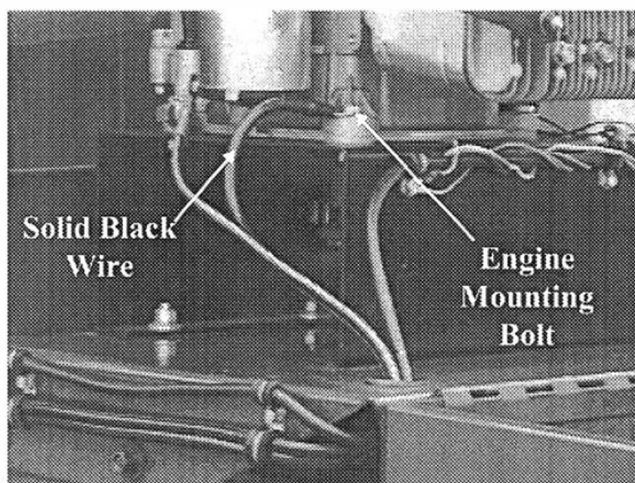
### Spreader Cable

1. At the rear of the spreader, feed the spreader cable up through the 1" grommet in the engine base used by the spreader harness. See Figure 25.



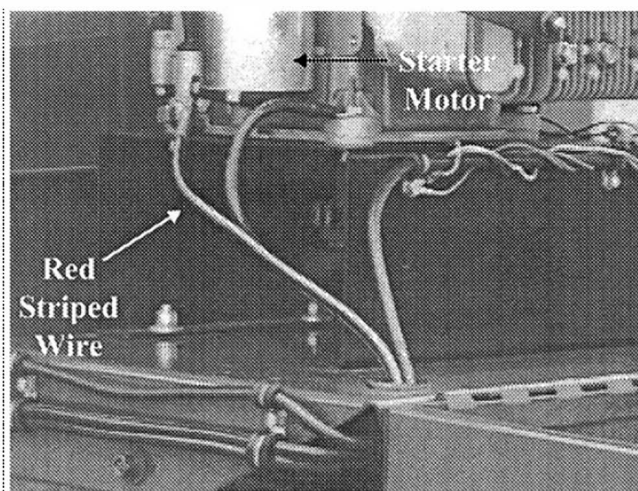
*Figure 25*

2. Attach the solid black wire of the spreader cable to the spreader engine using the existing 5/16" bolt, nut, lock washer, and supplied flat washer. See Figure 26.



*Figure 26*

3. Connect the red striped wire of the spreader cable to the starter motor terminal. See Figure 27.



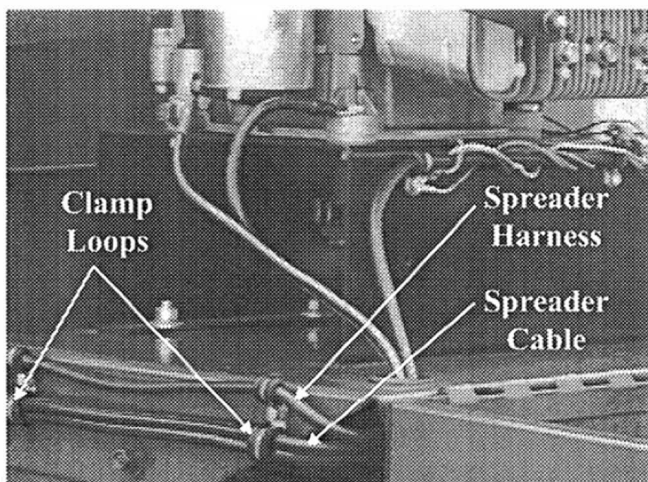
*Figure 27*



## INSTALLATION INSTRUCTIONS

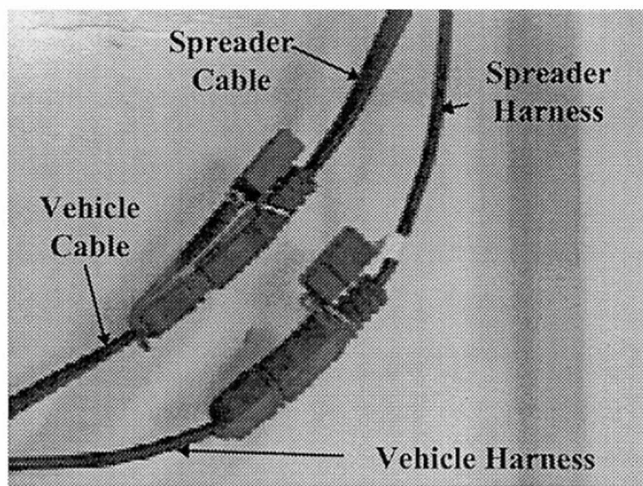
4. Route the spreader cable next to the spreader harness and secure to the side of the spreader with #10 clamp loops. See Figure 28.

**NOTE:** Use the fasteners that secure the spreader harness for securing the spreader cable.



*Figure 28*

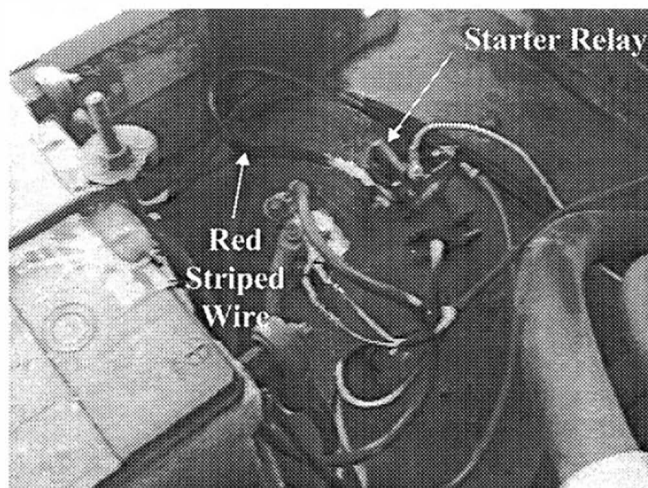
5. Connect the spreader cable to the vehicle cable. See Figure 29.



*Figure 29*

### Vehicle Cable

1. Route the vehicle cable under the cab, into the vehicle engine compartment, and over to the starter relay.
2. Secure the vehicle cable to the vehicle avoiding sharp edges, and hot or moving parts.
3. Verify the vehicle cable cannot drop onto the road when it is disconnected from the spreader.
4. Connect the solid black wire of the vehicle cable to the vehicle engine ground.
5. Connect the red striped wire to the unused secondary terminal of the starter relay. See Figure 30.



*Figure 30*

6. Reconnect the ground cable to the battery.

## INSTALLATION INSTRUCTIONS

### Chains

Check engine-to-electric clutch roller chain tension. Correct tension allows 5/16" deflection midway between the sprockets.

*To increase chain tension:* loosen the four (4) engine mount-to-engine base bolts and pull the engine away from the electric clutch. Re-tighten bolts. See Figure 31.

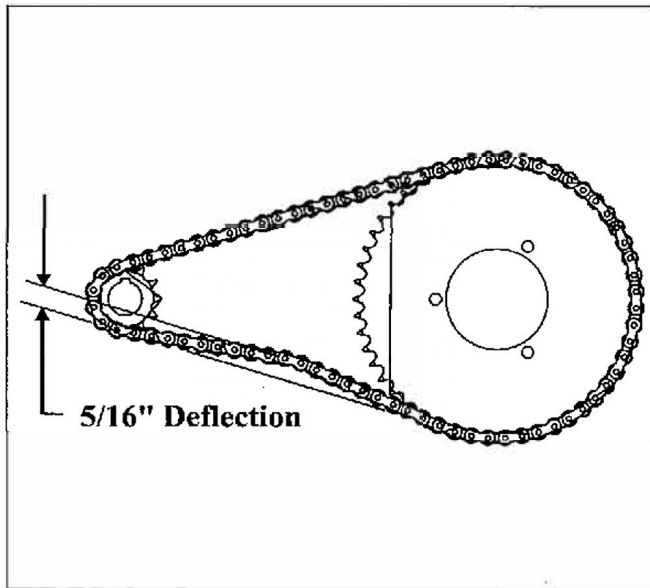


Figure 31

**CAUTION:** Overtightening the roller chains may damage the bearings on the gear case, the engine, and/or the spinner shaft. Overtightening will also shorten the life of the roller chain and of the sprockets.

Check the conveyor chain tension. To check the tension, measure in 20"-24" from the end of the sills. Push up on the chain with your hand. The conveyor chain should lift 1"-3" off the conveyor chain guide or cross angles. See Figure 32.

Use the (2) 5/8" x 6" take-up bolts at the front of the spreader to adjust conveyor chain tension.

Turn both bolts equal amounts to ensure the tension is equally distributed across both sides of the conveyor chain.

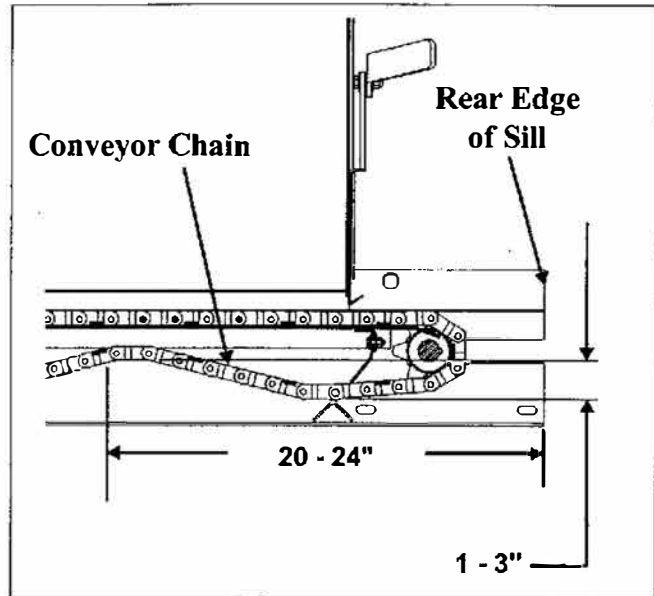


Figure 32

### Final Checklist

- ☐ Verify correct engine oil level. (See *Briggs & Stratton Engine Owner's Manual*.)
- ☐ Verify the gear case oil level is level with the fill hole.
- ☐ Verify correct engine-to-clutch sprocket alignment and chain tension.
- ☐ Verify correct gear case to spinner shaft sprocket alignment and chain tension.
- ☐ Verify correct conveyor chain tension.
- ☐ Verify the sprocket set screws are tightened.
- ☐ Verify dielectric grease is applied to all electrical connections.
- ☐ Verify wire harnesses are properly secured away from hot or moving parts.
- ☐ Verify vehicle harness cannot drop down below the truckbed when the spreader is removed from the truck.

# INSTALLATION INSTRUCTIONS

## Hydraulic Unit Installation

Recommended sequence of installation is as follows:

1. Pump (not available from DD).
2. Install hydraulic reservoir.
3. Install cab control valve (optional).
4. Install hydraulic hoses (not available from DD).
5. Fill hydraulic reservoir and check system.

### Pump

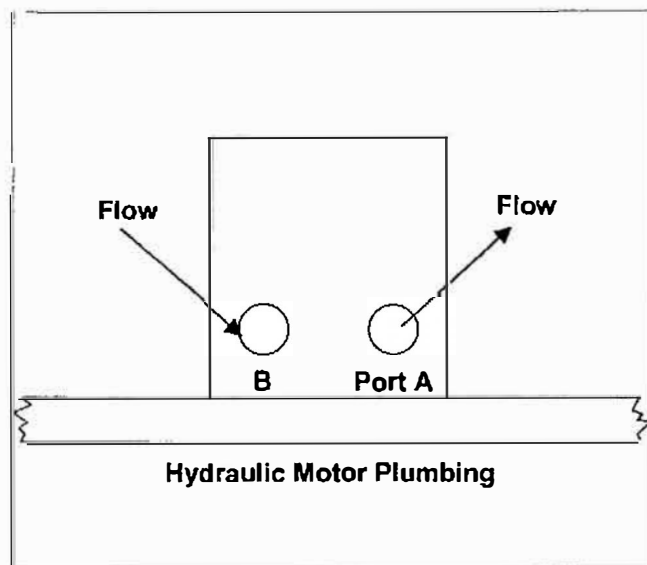
Because of the wide range of possible installations of this hopper spreader, no pump is supplied with this unit. If your truck does not have a pump suitable to your application, one may be purchased from a local truck equipment supplier. This pump should have a GPM output (9 GPM at normal operative RPM) at 1,500 PSI and 1" NPT suction and pressure ports.

### Hydraulic Reservoir Installation

Position the reservoir outlet as high, or higher than, the pump inlet. Keep the hose distance as short as possible. (Reservoir used should have a capacity of 1-1/2 to 2 times the pump maximum flow rate in gallons.)

## Cab Control Valve Installation

1. With the seat fully forward, select a suitable location to mount the cab control valve allowing for the operator to adjust the control and to turn it ON and OFF.
2. Check for clearance with ALL controls in the cab.
3. Under the cab, check for interference with transmission, etc.
4. Check to see that cab control valve location does not interfere with entering or leaving cab.
5. Fabricate a bracket to mount cab control valve in selected location.
6. Insert a grommet into all holes drilled for this installation.
7. Mount valve and plumb pump and motor to valve. Plumb Port "T" to reservoir, Port "P" to pressure side of pump, and Port "REG" of the valve to Port "B" of the motor.
8. Check machine for proper rotation of drive shafts and hydraulic leaks.



*Figure 33*



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